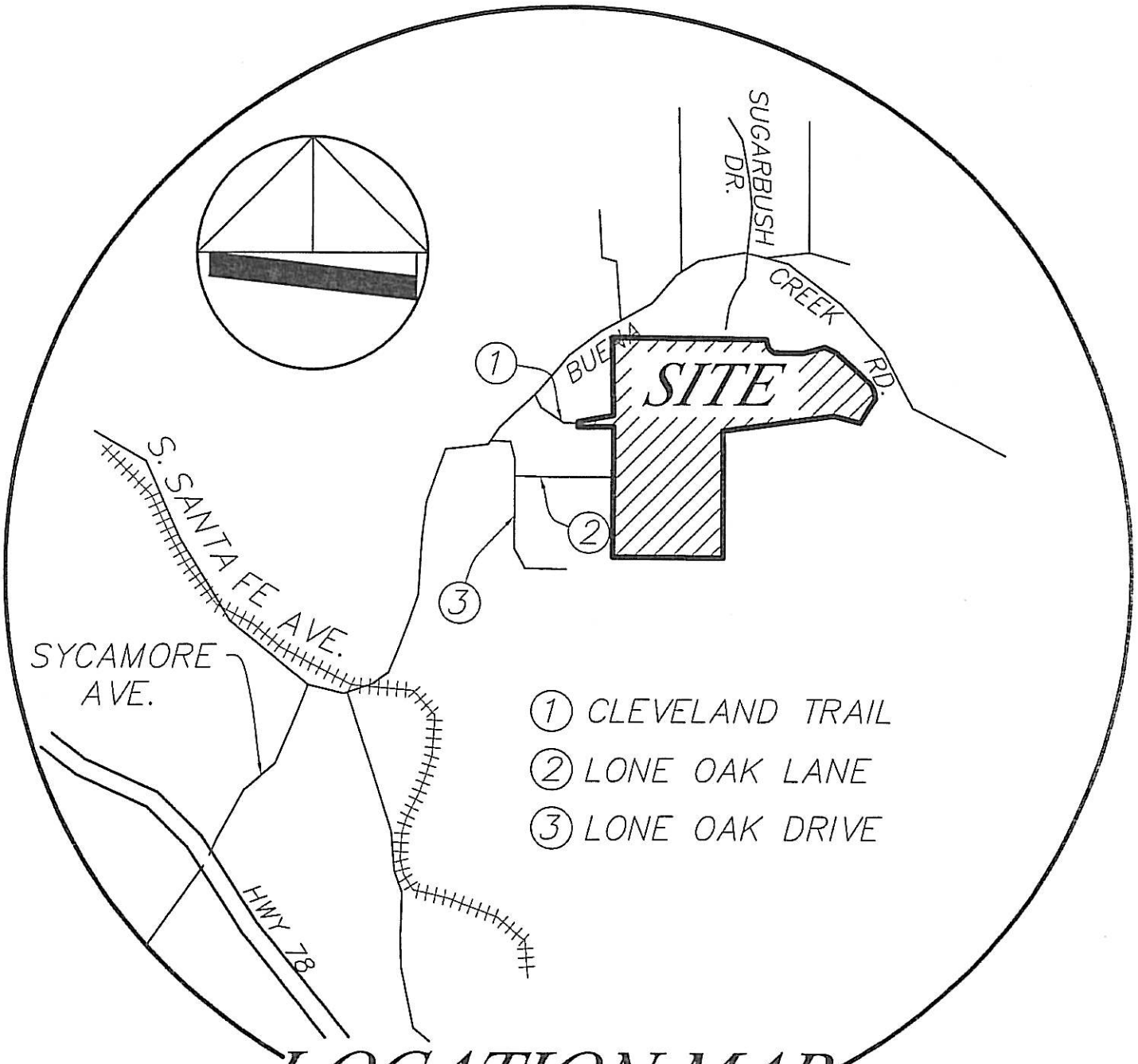
ATTACHMENT A

PROJECT LOCATION MAP



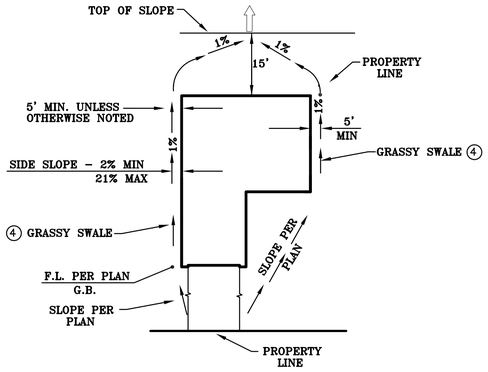
LOCATION MAP

NTS

ATTACHMENT B

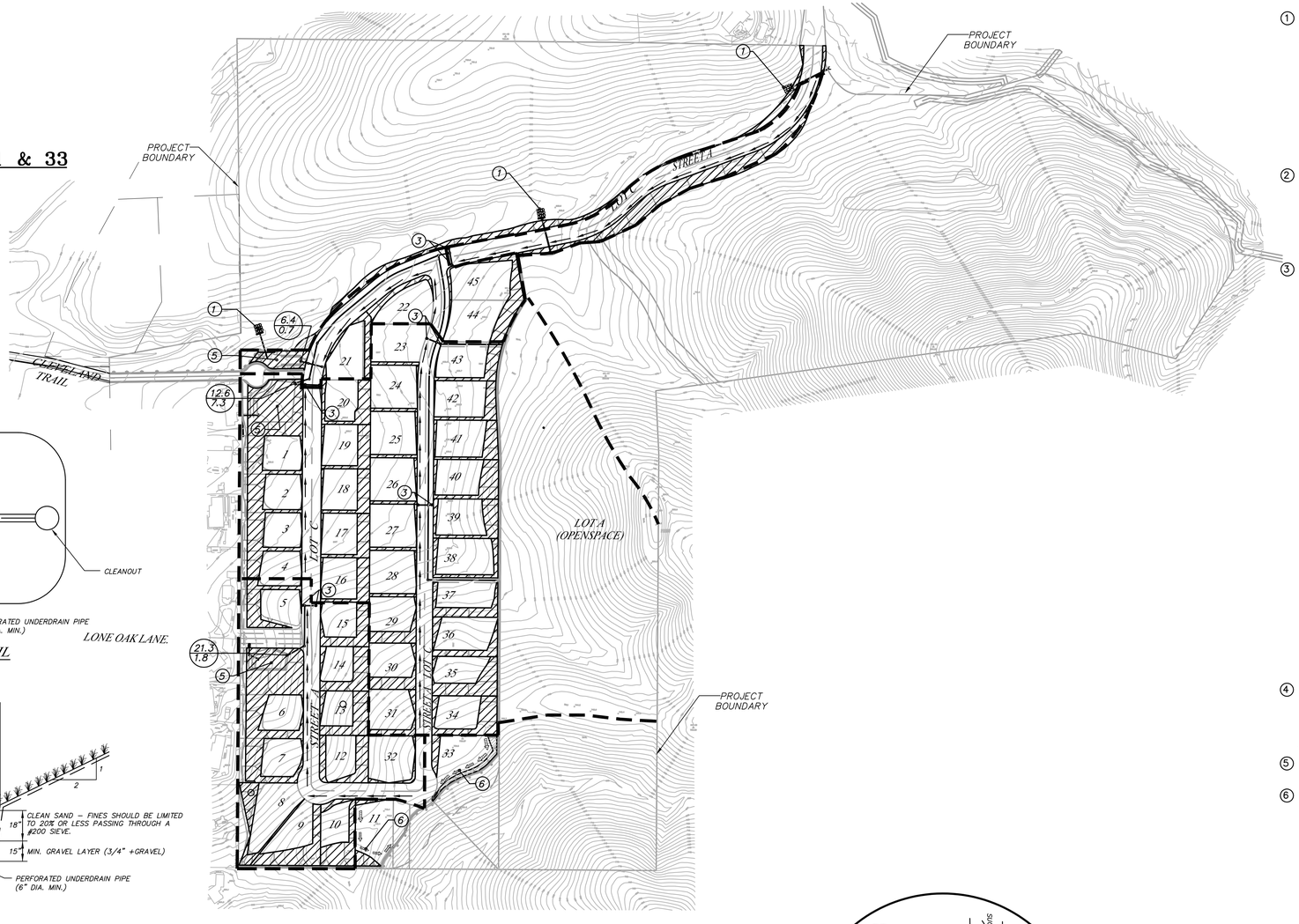
SITE MAP

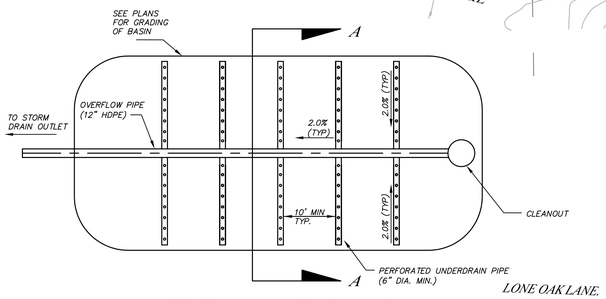
STORM WATER MANAGMENT PLAN EXHIBIT
FOR SUGARBUSH COUNTY OF SAN DIEGO
TRACT NO. 5295



TYPICAL GRADING FOR LOTS 11 & 33

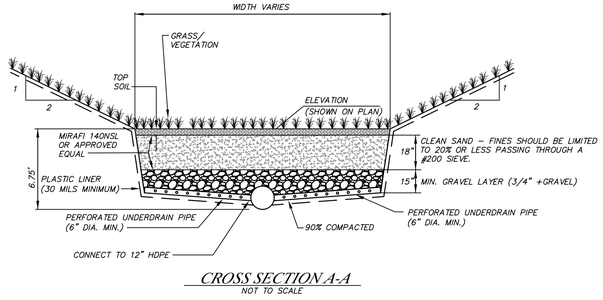
NOT TO SCALE





DETENTION BIORETENTION DETAIL

NOT TO SCALE



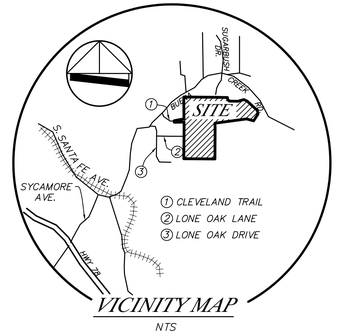
CROSS SECTION A-A

NOT TO SCALE

PLAN: SUGARBUSH

200' 100' 0 200 400 600

SCALE: 1" = 200'



VICINITY MAP

NTS

LEGEND

SURFACE NODE	12.6 / 7.3
STORMWATER RUNOFF (CFS)	
DIRECTION OF FLOW	→
STORM DRAIN	═══
BASIN LIMITS	- - -

POST-DEVELOPMENT BMPS

(1) RIP RAP ENERGY DISSIPATORS

SITE DESIGN BMPS

MINIMIZE IMPERVIOUS FOOTPRINT.

MINIMIZE DIRECTLY CONNECTED IMPERVIOUS AREAS BY DRAINING ROOF TOPS, PATIOS AND SIDEWALKS INTO ADJACENT LANDSCAPING.

MAXIMIZE CANOPY INTERCEPTION AND WATER CONSERVATION BY PLANTING ADDITIONAL NATIVE OR DROUGHT TOLERANT TREES AND LARGE SHRUBS.

CONVEY RUNOFF SAFELY FROM TOPS OF SLOPES.

(2) VEGETATE PERVIOUS AREAS WITH NATIVE OR DROUGHT TOLERANT VEGETATION

SIDEWALKS ARE DESIGNED TO MINIMUM WIDTHS BASED ON MUNICIPAL AND PUBLIC SAFETY STANDARDS.

CONSIDER USING POROUS PAVEMENT TO REPLACE IMPERVIOUS AREAS.

SOURCE CONTROL BMPS

(3) PROVIDE STORM WATER CONVEYANCE SYSTEM STENCILING AND SIGNAGE (SUCH AS: "NO DUMPING – I LIVE DOWN STREAM")

USE THE FOLLOWING METHODS TO REDUCE EXCESSIVE IRRIGATION RUNOFF:

EMPLOY RAIN SHUTOFF DEVICES TO PREVENT IRRIGATION AFTER PRECIPITATION.

DESIGN IRRIGATION SYSTEMS TO EACH LANDSCAPE AREA'S SPECIFIC WATER REQUIREMENTS.

USE FLOW REDUCERS OR SHUTOFF VALVES TRIGGERED BY A PRESSURE DROP OR LOSS IN THE EVENT OF BROKEN SPRINKLER HEADS OR LINES.

USE SOIL MOISTURE SENSORS TO REGULATE IRRIGATION.

EMPLOY OTHER COMPARABLE, EQUALLY EFFECTIVE, METHODS TO REDUCE IRRIGATION WATER RUNOFF.

DRAIN DRIVEWAYS INTO LANDSCAPED AREAS WHERE PRACTICABLE.

STREET SWEEPING AND VACUUMING.

LOW IMPACT DEVELOPMENT

CONSERVE NATURAL AREAS, SOILS, AND VEGETATION:

PROVIDE OPEN SPACE LOTS

MINIMIZE DISTURBANCE TO NATURAL DRAINAGES:

SET–BACK DEVELOPMENT ENVELOPE FROM DRAINAGES

MINIMIZE AND DISCONNECT IMPERVIOUS SURFACES:

CLUSTERED LOT DESIGN

DRAIN RUNOFF FROM IMPERVIOUS SURFACES TO PERVIOUS AREAS:

PITCH DRIVEWAYS PAVEMENTS TOWARD LANDSCAPING

(4) DIRECT DOWNSPOUTS FROM BUILDINGS INTO GRASSY SWALES

REUSE OF NATIVE SOILS AND INCORPORATE SMART IRRIGATION SYSTEMS IN LANDSCAPE DESIGN

TREATMENT CONTROL BMPS

(5) DETENTION BIORETENTION BASINS WILL TREAT RUNOFF FROM THE MAJORITY OF THE LOTS AND STREETS

(6) RUNOFF FROM RESIDENTIAL PADS ON LOT 11 AND LOT 33 WILL BE FILTERED BY A BIOFILTER (GRASSY SWALE)

NOTE: SIZE AND LOCATION OF CURB INLETS AND DETENTION BIORETENTION BASIN WILL BE DESIGNED DURING FINAL ENGINEERING.

PRIVATE CONTRACT

SHEET		
1	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	1 SHEETS

SWMP PLANS FOR:

SUGARBUSH PROPERTY
COUNTY OF SAN DIEGO

CALIFORNIA COORDINATE INDEX 370–1707

Grading Permit No. _____

bHA, Inc.
land planning, civil engineering, surveying
5115 AVENIDA ENCINAS
SUITE "L"
CARLSBAD, CA. 92008–4387
(760) 931–8700

BHA, INC. (760) 931–8700

ATTACHMENT C

RELEVANT MONITORING DATA

(NOTE: PROVIDE RELEVANT WATER QUALITY MONITORING DATA IF AVAILABLE.)

NO RELEVANT WATER QUALITY MONITORING DATA IS AVAILABLE

ATTACHMENT D

LID AND TREATMENT BMP LOCATION MAP

SEE SITE MAP FOR LID AND TREATMENT BMP LOCATIONS

ATTACHMENT E

TREATMENT BMP DATASHEET

*(**NOTE:** POSSIBLE SOURCE FOR DATASHEETS CAN BE FOUND AT WWW.CABMPHANDBOOKS.COM. INCLUDE ENGINEERING CALCULATIONS FOR SIZING THE TREATMENT BMP.)*

Treatment BMPs

The majority of the site will be treated by detention bioretention basins at Nodes 6.4, 12.6 and 21.3. The basins will consist of a vegetation, filter strip, sand and gravel bed, and a perforated underdrain pipe system contained in a plastic liner to convey the stormwater runoff. Peak runoff flows will be detained to simulate existing runoff conditions. See calculations for sizing of minimum area for detention bioretention basins.

Runoff from Lots 11 and Lot 33 will be treated by a Biofilter (Grassy swale) prior to leaving each lot. The primary purpose of the grass swale is to convey the runoff while effectively removing the pollutants of concern. The grassy swale is designed to convey the 100-year frequency storm event and treat the rainfall from an intensity (I) equal to 0.2 inches of rainfall per hour for each hour of a storm event. Manning's roughness coefficients of 0.024 will be used for a 100-year frequency storm event and 0.24 for water quality flows (Intensity equal to 0.2).

DETENTION BIORETENTION AREA SIZING

TM5295 - SUGARBUSH

County of San Diego

9-Jul-08

Minumum Detention Bioretention Area = Impervious surface area x 0.04

NODE 6.4

Impervious Areas Draining to BMP	Area (sf)	Sizing Factor	Minimum Surface Area (sf)
Roof and Driveways	21,260	0.04	850
Streets	34,851	0.04	1,394
		Minimum Bioretention-Detention Area	2,244

DETENTION BIORETENTION AREA SIZING

TM5295 - SUGARBUSH

County of San Diego

9-Jul-08

Minumum Detention Bioretention Area = Impervious surface area x 0.04

NODE 12.6

Impervious Areas Draining to BMP	Area (sf)	Sizing Factor	Minimum Surface Area (sf)
Roof and Driveways	154,472	0.04	6,179
Streets	128,847	0.04	5,154
		Minimum Bioretention-Detention Area	11,333

DETENTION BIORETENTION AREA SIZING

TM5295 - SUGARBUSH

County of San Diego

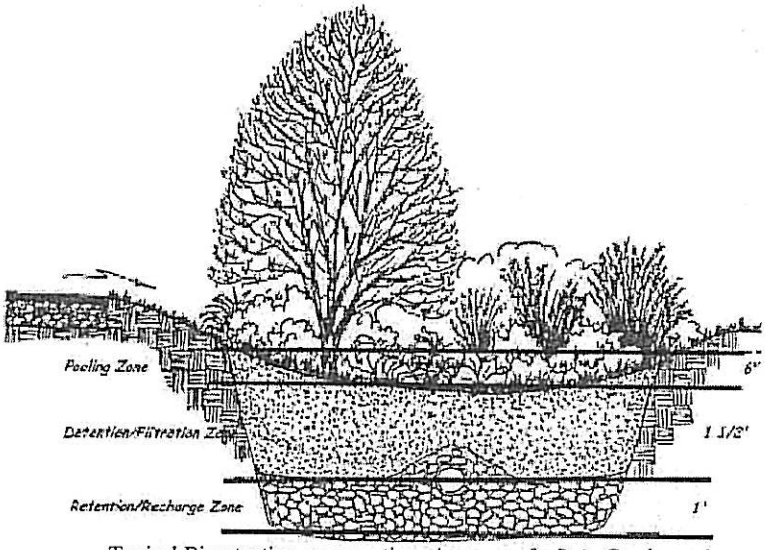
9-Jul-08

Minumum Detention Bioretention Area = Impervious surface area x 0.04

NODE 21.3

Impervious Areas Draining to BMP	Area (sf)	Sizing Factor	Minimum Surface Area (sf)
Roof and Driveways	60,292	0.04	2,412
Streets	33,000	0.04	1,320
		Minimum Bioretention-Detention Area	3,732

Fact Sheet 7. Bioretention Systems



Typical Bioretention cross section, *Anatomy of a Rain Garden,* n.d.

Bioretention systems are essentially a surface and sub-surface water filtration system. In function they are similar to sand filters. Bioretention systems incorporate both plants and underlying filter soils for removal of contaminants. These facilities normally consist of a treatment train approach: filter strip, sand bed, ponding area, organic layer, planting soil, and plants.

CHARACTERISICS

- Effective in removing sediments and attached pollutants by filtration through surface vegetation, ground cover and underlying filter media layer
- Delay runoff peaks by providing retention capacity and reducing flow velocities.
- Vegetation increases aesthetic value while also enhancing filtration capacity and helping to maintain the porosity of the filter media.
- Can be constructed as either large or small scale devices, with native or amended soils.
- Small scale units are usually located in a residential planter box that filters collected stormwater through the filter media and to an outlet.
- Larger scale devices work on the same methodology, however are generally located along the streetscapes and retarding basins over large open areas.
- In addition, there are two main types of bioretention system: Non-conveyance systems, which generally pond runoff volume, and Conveyance, which generally convey minor storm events along longitudinal channels. Such conveyance systems generally include an amended soil layer under the surface for additional storage and filtration

APPLICATION

- Effective in removing medium to fine size sediments and attached pollutants (such as nutrients, free oils/grease and metals), but typically have higher pollutant

removal efficiencies for a wider range of contaminants due to enhanced filtration/biological processes associated with the surface vegetation.

- Best suited to small residential, commercial, and industrial developments with high percentages of impervious areas, including parking lots, high density residential housing, and roadways.
- Aesthetic benefits due to the surface vegetation make bioretention systems appealing for incorporation into streetscape and general landscape features.

DESIGN

- Provide a gentle slope for overland flow and adequate water storage. No water should be allowed to pond in the bioretention system for longer than 72 hours.
- Usually designed in conjunction with swales and other devices upstream so as to reduce filter clogging and provide water treatment (treatment train).
- Filter media employed is usually the plant growing material, which may comprise soil, sand and peat mixtures.
- "Planting box" type systems should be restricted to very small catchment areas.
- A subdrain system should be included in urban areas along with associated cleanout to facilitate maintenance.
- For more precise design techniques, see: CASQA (2003, January) California Stormwater BMP Handbook: New Development and Redevelopment

MAINTENANCE

- Generally, only routine periodic maintenance typical of any landscaped area (mulching, plant replacement, pruning, weeding) is necessary.
- Regular inspections and maintenance are particularly important during the vegetation establishment period.
- Routine maintenance should include a biannual health evaluation of the trees and shrubs and subsequent removal of any dead or diseased vegetation.
- Other potential tasks include soil pH regulation, erosion repair at inflow points, mulch replenishment, unclogging the under-drain, and repairing overflow structures.

LIMITATIONS

- Adequate sunlight is required for vegetation growth.
- The use of irrigation may not meet State water conservation goals. Appropriate drought-tolerant plants should be considered.
- Placement may be limited by the need for upstream pre-treatment so as to avoid filter clogging (treatment train).
- Contributing drainage area should be less than 1 acre for small-scale, on-lot devices
- Bioretention (a BMP with incidental infiltration) is not an appropriate BMP when:
  - the seasonal high groundwater table is within 6 feet of the ground surface (US EPA 1999)
  - at locations where or where surrounding soil stratum is unstable
- exceptions to the 6 foot separation can be made when:
  - the BMP is designed with an under-drain and approved by a qualified licensed professional, or when:

  - written approval of a separation in the interval of 4-6 feet has been obtained by the Regional Water Quality Control Board and the Department of Environmental Health.
- Site must contain sufficient elevation relief so that subdrain system may discharge to receiving swale, curb or storm drain system.

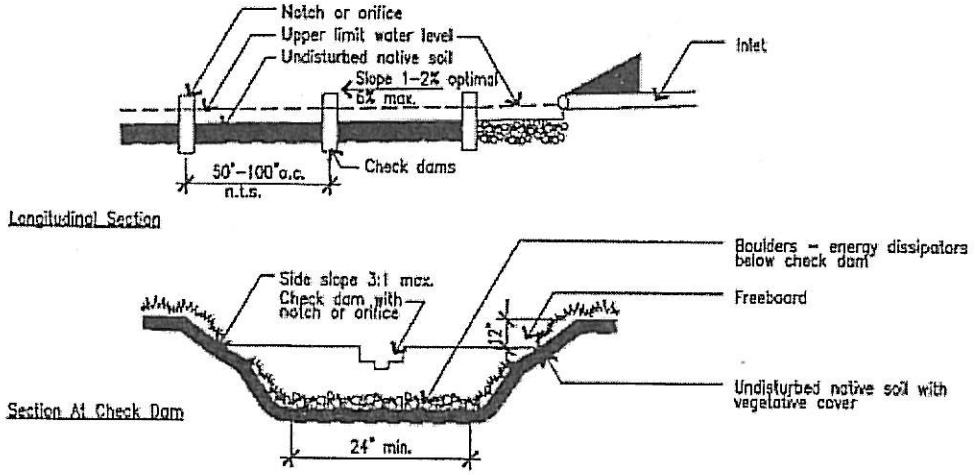
ECONOMICS

- Construction cost estimates for a bioretention area are slightly greater than those for the required landscaping for a new development (EPA, 1999).
- The operation and maintenance costs for a bioretention facility will be comparable to those of typical landscaping required for a site. (CASQA, 2003)
- Maintenance costs are projected at 5-7% of the construction cost annually.

REFERENCES

- California Stormwater Quality Association. (2003, January) California Stormwater BMP Handbook: New Development and Redevelopment.
- URS Australia Pty Ltd, (2004, May), Water Sensitive Urban Design: Technical Guidelines for Western Sydney, Upper Parramatta River Catchment Trust.
- US EPA (1999, September) BMP Fact Sheet 832-F-99-012. http://www.epa.gov/owm/mtb/biortn.pdf
- US EPA (1999, August) Preliminary Studies: Preliminary Data Summary of Urban Stormwater Best Management Practices. EPA-821-R-99-012 Part D.
- For additional information pertaining to Bioretention Systems, see the works cited in the San Diego County LID Literature Index.

Fact Sheet 4. Vegetated Swale / Rock Swale



Conditions, dimensions, and materials shown are typical. Modifications may be required for proper application, consult qualified professional.

Vegetated / rock swales are vegetated or rock lined earthen channels that collect, convey, and filter site water runoff and remove pollutants. Swales are an alternative to lined channels and pipes; configuration and setting are unique to each site.

CHARACTERISTICS

- If properly designed and maintained, swales can last for at least 50 years.
- Can be used in all soil types, natural or amended.
- When swales are not holding water, they appear as a typical landscaped area.
- Water is filtered by vegetation/rocks and pollutants are removed by infiltration into the subsurface of the soil.
- Swales also serve to delay runoff peaks by reducing flow velocities.

APPLICATION

- Swales are most effective in removing coarse to medium sized sediments.
- Parking lot medians, perimeters of impervious pavements.
- Street and highway medians, edges (in lieu of curb and gutter, where appropriate).
- In combination with constructed treatment systems or sand filters.

DESIGN

- Vegetation of each swale is unique to the setting, function, climate, geology, and character of each site and climatic condition.
- Can be designed with natural or amended soils, depending on the infiltration rate provided by the natural condition versus the rate needed to reduce surface runoff.
- Grass swales move water more quickly than vegetated swales. A grass swale is planted with salt grass; a vegetated swale is planted with bunch grass, shrubs or trees.
- Rocks, gravel, boulders, and/or cobbles help slow peak velocity, allow sedimentation, and add aesthetic value.

- Pollutant removal effectiveness can be maximized by increasing residence time of water in swale using weirs or check dams.
- Swales are often used as an alternative to curbs and gutters along roadways, but can also be used to convey stormwater flows in recreation areas and parking lots.
- Calculations should also be provided proving the swale capable of safely conveying the 100-year flow to the swale without flooding adjacent property or infrastructure.
- See County of San Diego Drainage Design Manual for design criteria. (section 5.5) http://www.sdcounty.ca.gov/dpw/docs/hydrologymanual.pdf

MAINTENANCE

- Swale maintenance includes mowing and removing clippings and litter. Vegetated swales may require additional maintenance of plants.
- Periodically remove sediment accumulation at top of bank, in swale bed, or behind check dams.
- Monitor for erosion and reseed grass or replace plants, erosion control netting and mulch as necessary. Fertilize and replace vegetation well in advance of rainy season to minimize water quality degradation.
- Regular inspections and maintenance is required during the establishment period.

LIMITATIONS

- Only suitable for grades between 1% and 6%; when greater than 2.5% should be paired with weir or check dam.
- "Turf" swales will commonly require irrigation and may not meet State water conservation goals.
- Irrigated vegetation is not appropriate in certain sites. Xeriscape techniques, natural stone and rock linings should be used as an alternative to turf.
- Wider road corridors may be required to incorporate swales.
- Contributing drainage areas should be sized to meet the stormwater management objective given the amount of flow that will be produced.
- When contributing flow could cause formation of low-flow channel, channel dividers must be constructed to direct flow and prevent erosion.

ECONOMICS

- Estimated grass swale construction cost per linear foot $4.50-$8.50 (from seed) to $15-20 (from sod), compare to $2 per inch of diameter underground pipe e.g., a 12" pipe would cost $24 per linear foot).
- $0.75 annual maintenance cost per linear foot

REFERENCES

- CALTRANS – Storm Water Handbook (cabmphandbooks.com)
- For additional information pertaining to Swales, see the works cited in the San Diego County LID Literature Index.

```
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                          Analysis prepared by:

                                BHA INC.
                        5115 AVENDIA ENCINAS, SUITE L
                             CARLSBAD, CA 92008
                               (760) 931-8700

--------------------------------------------------------------------------
  TIME/DATE OF STUDY: 13:17 07/09/2008
==========================================================================
 Problem Descriptions:
  LOT 11 - GRASSY SWALE
  STORWATER FLOW = 0.13CFS/2=0.07CFS

**************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
--------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =   20.00
            Z2(HORIZONTAL/VERTICAL) =   20.00
    BASEWIDTH(FEET) =     0.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.010000
    UNIFORM FLOW(CFS) =         0.07
    MANNINGS FRICTION FACTOR = 0.2400
==========================================================================
    NORMAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   0.17
    FLOW TOP-WIDTH(FEET) =          6.79
    FLOW AREA(SQUARE FEET) =            0.58
    HYDRAULIC DEPTH(FEET) =     0.08
    FLOW AVERAGE VELOCITY(FEET/SEC.) =      0.12
    UNIFORM FROUDE NUMBER =    0.073
    PRESSURE + MOMENTUM(POUNDS) =             2.05
    AVERAGED VELOCITY HEAD(FEET) =       0.000
    SPECIFIC ENERGY(FEET) =      0.170
==========================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =          2.43
    CRITICAL FLOW AREA(SQUARE FEET) =             0.07
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.03
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =      0.95
    CRITICAL DEPTH(FEET) =     0.06
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =              0.22
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =       0.014
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =       0.075
==========================================================================
```

```
**************************************************************************
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                    Analysis prepared by:

                          BHA INC.
                  5115 AVENDIA ENCINAS, SUITE L
                       CARLSBAD, CA 92008
                         (760) 931-8700

--------------------------------------------------------------------------
  TIME/DATE OF STUDY: 13:24 07/09/2008
==========================================================================
 Problem Descriptions:
  LOT 11 - GRASSY SWALE
  100 YEAR FLOW =CIA = 0.41*9.1*0.67 = 2.5CFS/2 = 1.25CFS
  ASSUME TC=5MIN
**************************************************************************
>>>>CHANNEL INPUT INFORMATION<<<<
--------------------------------------------------------------------------
    CHANNEL Z1(HORIZONTAL/VERTICAL) =   20.00
            Z2(HORIZONTAL/VERTICAL) =   20.00
    BASEWIDTH(FEET) =     0.00
    CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.010000
    UNIFORM FLOW(CFS) =         1.25
    MANNINGS FRICTION FACTOR = 0.0240
==========================================================================
    NORMAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    >>>>> NORMAL DEPTH(FEET) =   0.21
    FLOW TOP-WIDTH(FEET) =         8.47
    FLOW AREA(SQUARE FEET) =            0.90
    HYDRAULIC DEPTH(FEET) =     0.11
    FLOW AVERAGE VELOCITY(FEET/SEC.) =     1.39
    UNIFORM FROUDE NUMBER =    0.755
    PRESSURE + MOMENTUM(POUNDS) =            7.33
    AVERAGED VELOCITY HEAD(FEET) =      0.030
    SPECIFIC ENERGY(FEET) =      0.242
==========================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
--------------------------------------------------------------------------
    CRITICAL FLOW TOP-WIDTH(FEET) =         7.58
    CRITICAL FLOW AREA(SQUARE FEET) =           0.72
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =     0.09
    CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =     1.74
    CRITICAL DEPTH(FEET) =     0.19
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =            7.05
    AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =      0.047
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =      0.237
==========================================================================
```

```
**************************************************************************
****
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                          Analysis prepared by:

                              BHA, INC.
                        5115 Avenida Encinas, Suite L
                       Carlsbad, California 92008-4387


--------------------------------------------------------------------------
----
  TIME/DATE OF STUDY: 10:53 05/20/2009

==========================================================================
====
  Problem Descriptions:
   100-year flow calculation for vegetated swales around lots
   Q=CIA=(0.46)(9.22)(0.7)=2.97CFS - Q\2=1.48 CFS
   Tc=5 Min

**************************************************************************
****
 >>>>CHANNEL INPUT INFORMATION<<<<

--------------------------------------------------------------------------
----
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             Z2(HORIZONTAL/VERTICAL) =   50.00
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     CONSTANT CHANNEL SLOPE(FEET/FEET) = 0.010000
     UNIFORM FLOW(CFS) =         1.48
     MANNINGS FRICTION FACTOR = 0.0250

==========================================================================
====
     NORMAL-DEPTH FLOW INFORMATION:

--------------------------------------------------------------------------
----
     >>>>> NORMAL DEPTH(FEET) =   0.16
     FLOW TOP-WIDTH(FEET) =        16.21
     FLOW AREA(SQUARE FEET) =            1.31
     HYDRAULIC DEPTH(FEET) =     0.08
     FLOW AVERAGE VELOCITY(FEET/SEC.) =      1.13
     UNIFORM FROUDE NUMBER =    0.697
     PRESSURE + MOMENTUM(POUNDS) =             7.66
     AVERAGED VELOCITY HEAD(FEET) =       0.020
     SPECIFIC ENERGY(FEET) =      0.182

==========================================================================
====
     CRITICAL-DEPTH FLOW INFORMATION:
```

```
------------------------------------------------------------------------
----
     CRITICAL FLOW TOP-WIDTH(FEET) =         13.95
     CRITICAL FLOW AREA(SQUARE FEET) =            0.97
     CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      0.07
     CRITICAL FLOW AVERAGE VELOCITY(FEET/SEC.) =      1.52
     CRITICAL DEPTH(FEET) =      0.14
     CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =             7.19
     AVERAGED CRITICAL FLOW VELOCITY HEAD(FEET) =       0.036
     CRITICAL FLOW SPECIFIC ENERGY(FEET) =       0.175

========================================================================
====
```

ATTACHMENT F

OPERATION AND MAINTENANCE PROGRAM FOR TREATMENT BMPS

(NOTE: INFORMATION REGARDING OPERATION AND MAINTENANCE CAN BE OBTAINED FROM THE FOLLOWING WEB SITE:

HTTP://WWW.CO.SAN-DIEGO.CA.US/DPW/WATERSHEDS/LAND_DEV/SUSMP.HTML.)

OPERATION AND MAINTENANCE PROGRAM

Maintenance Schedule and Cost for BMPs

The operation and maintenance requirement (Appendix H Estimated O & M Costs for BMP Project from County of San Diego Stormwater Manual) for each type of BMP is as follows:

Biofilter - Grassy Swale						
Routine Action	Maintenance Indicator	Field Measurement	Measurement Frequency	Maintenance Activity	Site-Specific Requirement	Cost
Height of vegetation	Average vegetation height greater than 12 inches, emergence of trees or woody vegetation.	Visual observation and random measure-ments through out the side slope area.	Once during wet season, once during dry season	Cut vegetation to an average height of 6 inches and remove trimmings. Remove any trees, or woody vegetation.		$539.98
Assess adequate vegetative cover	Less than 90 percent coverage in strip invert/swale or less than 70 percent on swale side slope	Visual inspection of strip/swale. Prepare a site schematic to record location and distribution of barren or browning spots to be restored. File the schematic for assessment of persistent problems.	Assess quantity needed in May each year late wet season and late dry season.	Reseed/revegetate barren spots by Nov.		$547.19
				Scarify area to be restored to a depth of 2-inches. Restore side slope coverage with hydroseed mixture.		
				If after 2 applications (2 seasons) of reseeding/revege-tating and growth is unsuccessful both times, an erosion blanket or equivalent protection will be installed over eroding areas		

Biofilter - Grassy Swale						
Routine Action	Maintenance Indicator	Field Measurement	Measurement Frequency	Maintenance Activity	Site-Specific Requirement	Cost
Inspect for debris accumulation	Debris or litter present	Visual observation	During routine trashing, per district schedule	Remove litter, and debris.	None	$0
Inspection for accumulation sediment	Sediment at or near vegetation height, channeling of flow, inhibited flow due to change in slope.	Visual observation	Annually	Remove sediment. If flow in channeled, determine cause and take corrective action. If sediment becomes deep enough to change the flow gradient, remove sediment during dry season, characterize and properly dispose of sediment, and revegetate.	None	$1046.23
				Notify engineer to determine if regrading is necessary. If necessary, regrade to design specification and revegtate swale/strip. If regrading is necessary, the process should start in May. Revegetate strip/swale in Nov. Target completion prior to wet season.		$87.26
Inspect for burrows	Burrows/Visual holes, mounds	observation	Annually and after vegetation trimming	Where burrows cause seepage, erosion and leakage, backfill firmly.		$0

Biofilter - Grassy Swale						
Routine Action	Maintenance Indicator	Field Measurement	Measurement Frequency	Maintenance Activity	Site-Specific Requirement	Cost
General Maintenance Inspection	Inlet structures, outlet structures, side slopes or other features damaged, significant erosion, emergence of trees, woody vegetation, fence damage,ect.	Visual observation	Semi-Annually, late wet season and late dry season.	Corrective action prior to wet season. Consult engineer if an immediate solution is not evident.	Remove any trees, or woody vegeta-tion.	$751.76

Total Biofilter Grassy Swale $2,972.42

Detention Bioretention Basin						
Routine Action	Maintenance Indicator	Field Measurement	Measurement Frequency	Maintenance Activity	Site-Specific Requirement	Cost
Basin side slope planted for erosion protection and planted invert.	Average vegetation height greater than 12 inches, emergence of trees or woody vegetation.	Visual observation and random measure-ments through out the side slope area.	Once during wet season, once during dry season	Cut vegetation to an average height of 6 inches and remove trimmings. Remove any trees, or woody vegetation.		$2197.92
Slope Stability	Evidence of erosion	Visual Observation	October each year	Reseed/revegetate barren spots prior to wet season		$150.00
				Contact environmental or landscape architect for appropriate seed mix.		
				Scarify surface if needed		
				If after two applications (2 seasons) of reseeding/ revegetating and growth is unsuccessful both times, an erosion blanket or equivalent protection will be installed over erosion areas. No erosion blanket will be installed in the basin invert.	Not an annual cost	
Inspection for standing water	Standing water for more than 72 hours	Visual observation	Annually, 72 hours after a target2 storm (0.75 in) event	Drain Facility	None	
			Check and unclog orifice.	Should be annual maintenance		
			Notify engineer, if immediate solution is not evident.			

Detention Bioretention Basin						
Routine Action	Maintenance Indicator	Field Measurement	Measurement Frequency	Maintenance Activity	Site-Specific Requirement	Cost
Inspection for trash and debris	Debris/trash present	Visual observation	During routine trashing, per Districts schedule	Remove and dispose of trash and debris	None	
Inspection for sediment management and characteri-zation if sediment for removal	Sediment depth exceeds marker on staff gage	Measure depth at apparent maximum and minimum accumula-tion of sediment. Calculate average depth	Annually	Remove and property dispose of sediment. Regrade if necessary.		$1228.68 (once every 5 years)
Inspection for burrows	Burrows, holes, and mounds.	Visual observation	Annually and after vegetation trimming.	Where burrows cause seepage, erosion and leakage, backfill firmly.		
General Maintenance Inspection	Inlet structure, outlet structures, side slopes or other features damaged, significant erosion, emergence of tree or woody vegetation, graffiti or vandalism, fence damage, ect.	Visual observation	Semi-Annually, late wet season and late dry season monthly.	Corrective action prior to wet season. Consult engineers if immediate solution is not evident.	None	$751.76
Total Detention Bioretention Basin						$4328.36

ATTACHMENT G

FISCAL RESOURCES

FISCAL RESOURCES

The TM 5295RPL Sugarbush Project falls within the "Second Category" of the County of San Diego (County) Maintenance Mechanism because the use of detention bioretention basins and bio-filtration grassy swales as Best Management practices (BMP)s.

Second Category:

The County needs to assure ongoing maintenance of the detention bioretention basins. The biofilters (grassy swales) should only be a minimum concern to the County. Property owners will be given the primary responsibility for maintenance, on a perpetual basis (unless a stormwater utility is eventually formed). However, the County (in a "backup" role) needs to be able to step in and perform the maintenance if the property owner fails, and needs to have security to provide funding for such backup maintenance.

Mechanisms to Assure Maintenance:

Stormwater Ordinance Requirement: The County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (WPO) requires this ongoing maintenance. In the event that the mechanisms below prove ineffective, or in addition to enforcing those mechanisms, civil action, criminal action or administrative citation could also be pursued for violations of the ordinance.

Public Nuisance Abatement: Under the WPO failure to maintain a BMP would constitute a public nuisance, which may be abated under the Uniform Public Nuisance Procedure. This provides an enforcement mechanism additional to the above, and would allow costs of maintenance to be billed to the owner, a lien placed on the property, and the tax collections process to be used.

Notice to Purchasers: Section 67.819(e) of the WPO requires developers to provide clear written notification to persons acquiring land upon which a BMP is located, or others assuming a BMP is located, or others assuming a BMP maintenance obligation, of the maintenance duty.

Condition in Ongoing Land Use Permits: For those applications (listed in WPO Section 67.804) upon whose approval ongoing conditions may be imposed, a condition will be added which requires the owner of the land upon which the stormwater facility is located to maintain that facility in accordance with the requirements specified in the Standard Urban Stormwater Management Plan. Failure to perform maintenance may then be addressed as a violation of the permit, under the ordinance governing that permit process.

Subdivision Public Report: Tentative Map and Tentative Parcel Map approvals will be conditioned to require that, prior to approval of a Final or Parcel Map, the subdivider shall provide evidence to the Director of Public Works, that the subdivider has requested the California Department of Real Estates to include in the public report to be issued for the sales of lots within the subdivision, a notification regarding the maintenance requirement. (The requirement for this condition would not be applicable to subdivisions which are exempt from regulation under the Subdivided Lands Act, or for which no public report will be issued).

BMP Maintenance Agreement with Easement and Covenant: An agreement will be entered into with the County, which will function three ways:

(a) It will commit the land to being used only for purposes of the BMP;

(b) It will include an agreement by the landowner, to maintain the facilities in according with the CMP (this obligation would be passed on to future purchasers or successors of the landowner, as a covenant); and

(c) It will include an easement giving the County the right to enter onto the land (and any necessary adjacent land needed for access) to maintain the BMPs.

This would be required of all application listed in WPO Section 67.804. In the case of subdivisions, this easement and covenant would be recorded on or prior to the Final or Parcel Map.

Funding:

The Developer would provide the County with security to substantiate the maintenance agreement, which would remain in place for 5 years. The amount of the security would equal the estimated cost of 2 years of maintenance activities. The security can be a cash deposit, letter of credit, or other form acceptable to the County. If a stormwater utility or other permanent mechanism is put into place, it could assume either a primary or backup maintenance role.

ATTACHMENT H

CERTIFICATION SHEET

This Storm Water Mitigation Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Ronald L. Holloway
Registered Civil Engineer

5/26/09
Date

ATTACHMENT I

ADDENDUM

ATTACHMENT J

2006 CWA SECTION 303(d)
LIST OF WATER QUALITY LIMITED SEGMENT

2006 CWA SECTION 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS REQUIRING TMDLS

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

USEPA APPROVAL DATE: JUNE 28, 2007

REGION	TYPE	NAME	CALWATER WATERSHED	POLLUTANT/STRESSOR	POTENTIAL SOURCES	ESTIMATED SIZE AFFECTED	PROPOSED TMDL COMPLETION
9	R	Agua Hedionda Creek	90431000				
				Manganese		7 Miles	2019
					Source Unknown		
				Selenium		7 Miles	2019
					Source Unknown		
				Sulfates		7 Miles	2019
					Source Unknown		
				Total Dissolved Solids		7 Miles	2019
					Urban Runoff/Storm Sewers		
					Unknown Nonpoint Source		
					Unknown point source		
9	E	Agua Hedionda Lagoon	90431000				
				Indicator bacteria		6.8 Acres	2006
					Nonpoint/Point Source		
				Sedimentation/Siltation		6.8 Acres	2019
					Nonpoint/Point Source		
9	R	Aliso Creek	90113000				
				Indicator bacteria		19 Miles	2005
				This listing for indicator bacteria applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.			
					Urban Runoff/Storm Sewers		
					Unknown point source		
					Nonpoint/Point Source		
				Phosphorus		19 Miles	2019
				This listing for phosphorus applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.			
					Urban Runoff/Storm Sewers		
					Unknown Nonpoint Source		
					Unknown point source		

2006 CWA SECTION 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS REQUIRING TMDLS

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

USEPA APPROVAL DATE: JUNE 28, 2007

REGION	TYPE	NAME	CALWATER WATERSHED	POLLUTANT/STRESSOR	POTENTIAL SOURCES	ESTIMATED SIZE AFFECTED	PROPOSED TMDL COMPLETION
				Toxicity		19 Miles	2019
				This listing for toxicity applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.			
					Urban Runoff/Storm Sewers		
					Unknown Nonpoint Source		
					Unknown point source		
9	E	Aliso Creek (mouth)	90113000				
				Indicator bacteria		0.29 Acres	2005
					Nonpoint/Point Source		
9	L	Barrett Lake	91130000				
				Color		125 Acres	2019
					Source Unknown		
				Manganese		125 Acres	2019
					Source Unknown		
				pH		125 Acres	2019
					Source Unknown		
9	R	Buena Creek	90432000				
				DDT		4.8 Miles	2019
					Source Unknown		
				Nitrate and Nitrite		4.8 Miles	2019
					Source Unknown		
				Phosphate		4.8 Miles	2019
					Source Unknown		
9	R	Buena Vista Creek	90421000				
				Sediment Toxicity		11 Miles	2019
					Source Unknown		
9	E	Buena Vista Lagoon	90421000				
				Indicator bacteria		202 Acres	2008
					Nonpoint/Point Source		